Valued Non-Pain Goals Attenuate Avoidance Behavior in the Context of Pain

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INTRODUCTION

Fear-Avoidance models propose that dysfunctional beliefs about pain induce a pattern of defensive responses, possibly leading to the development, maintenance, and exacerbation of chronic pain. Several studies have provided empirical evidence for the pivotal role of **pain-related fear** in the development and maintenance of chronic pain[1, 2, 3].
However, pain-related fear does **not** occur in a **motivational vacuum**, but in a context of multiple, often **competing goals**.

RESEARCH AIM

The current experiment therefore aims to include a motivational context. We hypothesized that when performing painful movements, introducing a **valued non-pain goal** (winning money) would result in ***less fear of pain*** and ***less defensive responses*** of the painful CS+ movement.

METHODS

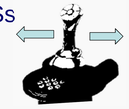
STIMULI

USs

Pain-US
Electrocutaneous stimulation

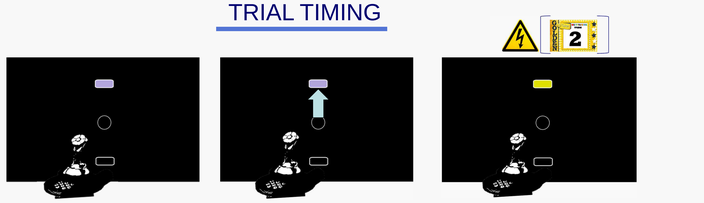
Reward-US
Lottery Ticket
(Possibility of winning an additional € 50)

CSs



Proprioceptive Movements
Vertical (up/down) and horizontal (left/right) movement pane

TRIAL TIMING



3.5 s fixation cross
Indication target

Performance CS movement

Successful movement
Administration pain-US and reward-US after CS+ movement

PARTICIPANTS

N = 55 (28 ♂, 27♀)
Age 18-34
10 Left-handed
5 excluded from further analysis

MEASURES

Self-reported measures (0-10 scale):
- ❑ Stimulus Expectancy
- ❑ Pain-related fear
- ❑ Stimulus Unpleasantness
- ❑ Painfulness of stimulation
- ❑ Tolerability of stimulation

Reaction times:
- ❑ Response Latency (movement onset)
- ❑ Response Duration (performance movement)

Choice Behavior
Decision to perform either the CS+ or CS- movement during free choice test.

DESIGN

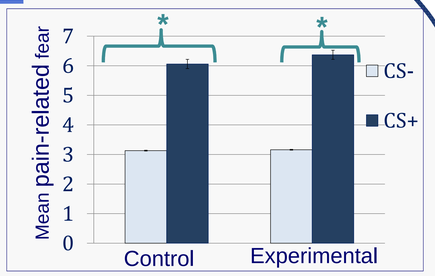
Within-subjects crossover design
2 conditions: **control** (Pain-US) and **experimental** (Pain and Reward-US)
- ❑ Each condition performed in a different movement pane
- ❑ **Reinforcement** rate 50%, except in free choice test: 100%

	ACQUISITION	REINFORCED TEST	FREE CHOICE TEST
Control	3 { 6 CS+, 6 CS-}	6 CS+, 6 CS-	4 {CS+ OR CS-}
Experimental	3 { 6 CS+, 6 CS-}	6 CS+, 6 CS-	4 {CS+ OR CS-}

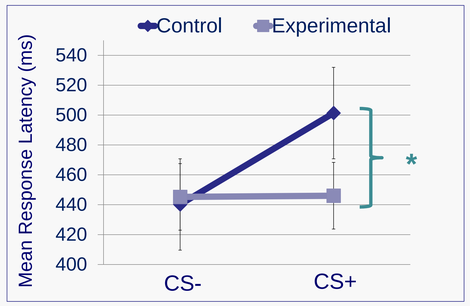
RESULTS

SELF-REPORTED MEASURES

- ❑ **Successful acquisition** in both conditions
- ❑ **Differential** CS+/CS- **expectancy** ratings, but **no** differences between conditions
- ❑ **Higher fear** of pain ratings for CS+ than for CS- in both conditions, but **no** differences between conditions
- ❑ **No** difference in **pain intensity** between conditions



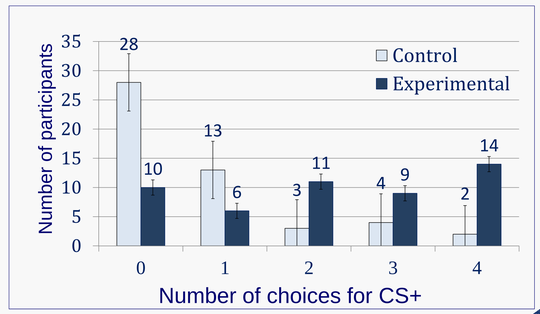
REACTION TIMES



- ❑ **No** Difference in **response duration** between stimuli or conditions
- ❑ In the **Control** condition, participants are **slower** to **initiate** the **CS+** movement compared to the CS- movement. In the **Experimental** condition however, this difference in response latencies **vanishes**

CHOICE BEHAVIOR

- ❑ Participants chose to perform the **painful CS+** movement **significantly more often** when a concurrent **reward** was presented, compared to when the reward was absent. This difference was even significant *per choice trial*.



CONCLUSION

- ❑ **No** effect of a concurrent reward on subjective **self-reported measures.** Adding a concurrent **reward** did **not** result in **lower fear of pain** ratings.
- ❑ Inclusion of a valued non-pain goal did result in **attenuation of defensive responses** (i.e., less avoidance), as indicated by
  - ❑ the non-differential **response latencies** in the Experimental condition (↔ Control condition)
  - ❑ **Choice** behavior: choosing the painful movement significantly more often when concurrent reward is present
- ❑ This study thus provides preliminary experimental **support** for the influence of **motivational factors** on **pain avoidance.** However, more research is needed to uncover the effects of non-pain goals on pain avoidance.

1 Leeuw, L., et al. (2007). The fear-avoidance model of musculoskeletal pain: current state of scientific evidence. *J Behav Med, 30(1),*77-94
2 Asmundson G.J.G., et al. (1999).Beyond pain: the role of fear and avoidance in chronicity. *Clin Psychol Rev,19*, 97–119
3 Turk, D. C., et al. (2010). Fear of pain as a prognostic factor in chronic pain: conceptual models, assessment, and treatment implications. *Curr pain headache rep*, *14*(2), 88-95